Reviewer	Manying Xue, Chemist RAB3/HED (7509C)	Date: 07/22/04
Approved by	Leung Cheng, Ph.D., Senior Chemist RAB3/HED (7509C)	Date: 07/22/04

This DER was originally prepared under contract by Dynamac Corporation (20440 Century Boulevard, Suite 100; Germantown, MD 20874; submitted 02/26/2004). The DER has been reviewed by the HED and revised to reflect current OPP policies.

STUDY REPORT:

45903602 Leonard, R. (2003) Magnitude of BAS 500 F and BAS 510 F Residues in Soybean: Final Report: Lab Project Number: 2002/5004272:BASF Study Number 140578. Unpublished study prepared by BASF Agro Research. 157 p.

EXECUTIVE SUMMARY:

BASF Corporation has submitted field trial data for residues of pyraclostrobin and its metabolite 500-3 in/on soybeans. A total of 17 soybean field trials were conducted encompassing Regions 2 (GA and VA; 2 trials), 4 (AR; 2 trials), 5 (IA, IL, MN, ND, NE, SD, and WI; 12 trials), and 5B (QC; 1 trial), during the 2002 growing season. At each test location a total of two broadcast foliar spray applications of the 20% BAS 500 F WG formulation were made at ~0.2 lb ai/A/application with a 6- to 8-day retreatment interval, for a total seasonal rate of ~0.4 lb ai/A. Applications were made according to two treatment types. For treatment type A, the first application was made 12 days prior to harvest of immature seed and the second application was made 7 (± 1) days after the first application. For treatment type B, the first application was made 28 days prior to mature seed harvest and the second application was made 7 (± 1) days after the first application. Applications were made using ground equipment in ~20-39 gal/A of water with a non-silicone spray adjuvant added to the spray mixture. Samples of green immature soybean seed and soybean forage were collected ~5 and ~14 days, respectively, following treatment type A. Samples of mature soybean seed and soybean hay were collected ~21 days following treatment type B. Additional samples of soybean seed from the control and treatment type B plot were collected from a single NE field trial for generation of commercially representative aspirated grain fraction (AGF) samples. The 20% BAS 500 F WG formulation used in the soybean field trials also contained another experimental active ingredient (BAS 510 F) as part of the tank-mix; data for the BAS 510 active ingredient are not reviewed herein.

Samples of soybean forage, seed (immature green and mature), hay, and aspirated grain fractions were analyzed by BASF Agro Research (Research Triangle Park, NC) for residues of pyraclostrobin and its metabolite BF 500-3 using LC/MS/MS, BASF Method Number D9908. The method limit of quantitation (LOQ) was 0.02 ppm for each analyte (pyraclostrobin and BF

500-3) in/on all soybean matric ;. This method is adequate for data collection based on acceptable concurrent method r :overy data.

The maximum storage intervals of crop samples from harvest to analysis were 170 days (5.6 months) for immature soyt an seed, 174 days (5.7 months) for soybean forage, 130 days (4.3 months) for mature soybea seed, 142 days (4.7 months) for soybean hay, and 99 days (3.3 months) for aspirated grair fractions. No storage stability data have been submitted with this petition. Available storage stat lity data indicated that residues of pyraclostrobin and its metabolite BF 500-3 are relativ ly stable under frozen storage conditions in/on fortified samples of grape juice, sugar beet tops a ıd roots, tomatoes, and wheat grain and straw for up to 25 months, and in/on fortified sam les of peanut nutmeat and processed oil for up to 19 months. The storage stability data can b translated to support the storage intervals for soybean, forage and hay for this study (D26966 , etc., L. Cheng, 11/28/2001).

The results from the soybean fi ld trials show that the maximum combined residues of pyraclostrobin and its metaboli : BF 500-3 were 0.362 ppm in/on treated samples of green immature soybean seed and 3.8 ' ppm in/on treated samples of soybean forage harvested at the 5/6- and 13/14-day PHI, respec vely, following treatment type A. The maximum combined residues of pyraclostrobin and s metabolite BF 500-3 were <0.04 ppm in/on treated samples of mature soybean seed and 6.13 ı pm in/on treated samples of soybean hay harvested at the 20- to 22-day PHI following treatmer type B.

Residues of pyraclostrobin and ts metabolite BF 500-3 concentrated 3.4x in aspirated grain fractions collected from treatec soybean seed, which bore residues below the method LOQ (<0.02 ppm) for each analyte. he combined residues of pyraclostrobin and its metabolite BF 500-3 were <0.08 and 0.19 pm (average 0.135 ppm) in aspirated grain fractions from soybean seed harvested at the 1 1-day PHI following treatment B from a single trial.

STUDY/WAIVER ACCEPT BILITY/DEFICIENCIES/CLARIFICATIONS:

Under the conditions and para eters used in the study, the field trial residue data are classified as scientifically valid. It is noted hat the number and location of field trials conducted for soybeans is not in full compliance with (PPTS Guideline 860.1500; however, the observed residues of the parent and its metabolite BF 5 0-3 were each below the LOQ of 0.02 ppm in/on treated samples of mature soybean seed. The a :ceptability of this study for regulatory purposes is addressed in the forthcoming U.S. EPA Re due Chemistry Summary Document, DP Barcode D290369.

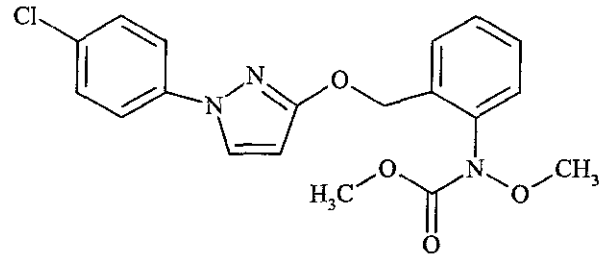
COMPLIANCE:

Signed and dated GLP, Qualit Assurance and Data Confidentiality statements were provided. No deviations from regulatory equirements were reported which would have an impact on the validity of the study.

A. BACKGROUND INI ORMATION

Pyraclostrobin is a fungicide that is structurally related to the naturally occurring strobilurins, compounds derived from some fungal species. Pyraclostrobin is also in the same chemical class as azoxystrobin (PC 128810), registered for many crops and turf/lawn, and trifloxystrobin (PC 129112) which recently was granted a "reduced risk" status as a fungicide on many crops. The biochemical mode of action of these compounds is inhibition of electron transport in pathogenic fungi.

Table 1. Pyraclostrobin Nomenclature.

Compound	
Common name	Pyraclostrobin
Company experimental name	BAS 500 F
IUPAC name	methyl *N*-{2-[1-(4-chlorophenyl)-1*H*-pyrazol-3-yloxymethyl]phenyl}(*N*-methoxy)carbamate
CAS name	methyl [2-[[[1-(4-chlorophenyl)-1*H*-pyrazol-3-yl]oxy]methyl]phenyl]methoxycarbamate
CAS #	175013-18-0
End-use products/EPs	20% water dispersible granular formulation (WG; product name: Cabrio™ EG Fungicide; EPA Reg. No. 7969-187/EPA File Symbol 7969-RIT).

Pyraclostrobin technical is a white to light beige solid.

TABLE A.2. Physicochemical Properties

Parameter	Value	Reference[1]
Melting point	63.7-65.2 °C	D269848 & D274191
Density	1.285g/cm^3 at 20°C	D269848 & D274191
Water solubility (20°C)	2.41 mg/L in deionized water at 20°C 1.9 mg/L in buffer system pH 7 at 20°C 2.3 mg/L in buffer system pH 4 at 20°C 1.9 mg/L in buffer system pH 9 at 20°C	D269848 & D274191
Solvent solubility (mg/L at 20°C)	acetone (≥160 mg/L); methanol (11 mg/L); 2-propanol (3.1 mg/L); ethyl acetate (≥160 mg/L); acetonitrile (≥76 mg/L); dichloromethane (≥110 mg/L); toluene (≥100 mg/L); n-heptane (0.36 mg/L); 1-octanol (2.4 mg/L); olive oil (2.9 mg/L); DMF (≥62 mg/L).	D269848 & D274191
Vapour pressure at 25°C	2.6 x 10^{-10} hPa (at 20°C); 6.4 x 10^{-10} hPa	D269848 & D274191
Dissociation constant (pK_a)	Does not dissociate in water. There are no dissociable moieties.	D269848 & D274191

TABLE A.2. Physicochemical Pro erties			
Parameter		Value	Reference[1]
Octanol/water partition coefficient Log(	ow)	n-Octanol/water partition coefficient (K_{ow}) at room temperature (=K_{ow} of 3.80, pH 6.2; =log K_{ow} 4.18, pH 6.5).	D269848 & D274191

[1] Product Chemistry data were reviewed by the Registration Division (D269848 and D274191, 5/3/01, 5/15/01, and 6/7/01, S. Malak)

B. EXPERIMENTAL DI SIGN

B.1. Study Site Informatio

TABLE B.1.1. Trial Site Condit ns.							
Trial Identification (City, State; Year) [1]	Soil		haracteristics			Meteorological data	
	Type	%	M	pH	CEC	Overall monthly rainfall range (inches)	Overall temperature range (°C) [2]
GA; 2002	Not a		plicable			Not reported	25.6-30.0
VA; 2002	Not a		plicable			Not reported	16.8-26.0
AR; 2002	Not a		plicable			Not reported	21.7-32.2
AR; 2002	Not a		plicable			Not reported	16.1-20.6
WI; 2002	Not a		plicable			Not reported	21.7-27.2
MN; 2002	Not a		plicable			Not reported	25.6-30.0
IA; 2002	Not a		plicable			Not reported	23.3-27.2
IA; 2002	Not a		plicable			Not reported	19.4-27.2
NE; 2002	Not		plicable			Not reported	21.1-32.2
NE; 2002	Not		plicable			Not reported	22.7-30.9
ND; 2002	Not		plicable			Not reported	21.1-26.1
ND; 2002	Not		plicable			Not reported	20.6-25.0
ND; 2002	Not		plicable			Not reported	15.6-32.2
SD; 2002	Not		plicable			Not reported	15.6-28.9
IL; 2002	Not		plicable			Not reported	10.6-23.9
IL; 2002	Not		plicable			Not reported	17.8-22.8
QC; 2002	Not		plicable			Not reported	20-27

[1] The location (city) of the trial site was ot specified.
[2] Air temperature was only provided for lays of application.

The petitioner did not include ny information pertaining to weather conditions over the course of the field trials except to des ribe the conditions which occurred during application of the test substance. However, the petit oner did include a statement that the total rainfall and monthly maximum and minimum air te nperatures during the duration of the studies were "normal"; rainfall within 20% and tempe atures within 10% of the 10 year seasonal/monthly norms. Trials with variations from "normal' were listed by the petitioner, but these weather abnormalities were not expected to impact the stu y results.

TABLE B.1.2. Study Use Pattern.

Location (State/Province; Year)	EP[1]	Application						Tank Mix Adjuvants
		Treatment type [2]	Method; Timing	Vol. (GPA[3])	Rate (lb ai/A)	RTI[4] (days)	Total Rate (lb ai/A)	
GA; 2002	20% WG	A	1: Broadcast foliar; ~30% pods reached final length (15-20 mm)	29.41	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~all pods reached final length (15-20 mm)	38.93	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	38.04	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; first pod ripe, beans final color, dry & hard	36.78	0.20			
VA; 2002	20% WG	A	1: Broadcast foliar; ~70% pods reached final length (15-20 mm)	33.63	0.21	7	0.41	Non-silicone spray adjuvant
			2: Broadcast foliar; ~all pods reached final length (15-20 mm)	33.54	0.20			
		B	1&2: Broadcast foliar; ~all pods reached final length (15-20 mm)	34.12	0.21	7	0.41	Non-silicone spray adjuvant
				32.25	0.20			
AR; 2002	20% WG	A	1&2: Broadcast foliar; ~all pods reached final length (15-20 mm)	22.61	0.20	7	0.40	Non-silicone spray adjuvant
				22.77	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	22.71	0.20	8	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~40% of leaves discolored or fallen	21.82	0.20			
AR; 2002	20% WG	A	1&2: Broadcast foliar; ~all pods reached final length (15-20 mm)	30.06	0.20	7	0.40	Non-silicone spray adjuvant
				29.86	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	30.23	0.20	8	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~10% pods ripe, beans final color, dry & hard	30.11	0.20			

TABLE B.1.2. Study Use Pattern.

Location (State/Province; Year)	EP[1]	Application						Tank Mix Adjuvants
		Treatment type [2]		Method; Timing	Vol. (GPA[3])	Rate (lb ai/A)	RTI[4] (days)	Total Rate (lb ai/A)	
WI; 2002	20% WG	A	1: B	adcast foliar; ~70% pods reac d final length (15-20 mm)	25.20	0.20	7	0.40	Non-silicone spray adjuvant
			2: B	adcast foliar; ~all pods reac d final length (15-20 mm)	25.19	0.20			
		B	1&2	Broadcast foliar; ~all pods reac d final length (15-20 mm)	25.34	0.20	7	0.40	Non-silicone spray adjuvant
					25.10	0.20			
MN; 2002	20% WG	A	1: B	oadcast foliar; ~70% pods reac d final length (15-20 mm)	25.34	0.20	7	0.40	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~all pods reac d final length (15-20 mm)	25.35	0.20			
		B	1&2	Broadcast foliar; ~all pods reac d final length (15-20 mm)	25.49	0.20	7	0.40	Non-silicone spray adjuvant
					25.25	0.20			
IA; 2002	20% WG	A	1: B	oadcast foliar; ~70% pods reac ed final length (15-20 mm)	25.52	0.20	7	0.41	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~all pods reac ed final length (15-20 mm)	28.36	0.21			
		B	1: B	oadcast foliar; ~all pods reac ed final length (15-20 mm)	29.55	0.21	7	0.41	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~10% pods ripe beans final color, dry & hard	25.31	0.20			
IA; 2002	20% WG	A	1: B	oadcast foliar; ~70% pods reac ed final length (15-20 mm)	28.15	0.20	7	0.41	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~all pods reac ed final length (15-20 mm)	26.78	0.21			
		B	1: B	oadcast foliar; ~all pods reac ed final length (15-20 mm)	26.49	0.20	8	0.41	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~10% pods ripe beans final color, dry & hard	24.70	0.21			
NE; 2002	20% WG	A	1: B	oadcast foliar; end of flo ering: 1st pods visible (~5mm len h)	19.99	0.20	6	0.40	Non-silicone spray adjuvant
			2: B	oadcast foliar; first pods rea ed final length (15-20 mm)	20.08	0.20			
		B	1: B	oadcast foliar; ~50% pods rea ed final length (15-20 mm)	20.03	0.20	8	0.40	Non-silicone spray adjuvant
			2: B	oadcast foliar; ~10% pods rip beans final color, dry & hard	20.04	0.20			

TABLE B.1.2. Study Use Pattern.

Location (State/Province; Year)	EP[1]	Application						Tank Mix Adjuvants
		Treatment type [2]	Method; Timing	Vol. (GPA[3])	Rate (lb ai/A)	RTI[4] (days)	Total Rate (lb ai/A)	
NE; 2002	20% WG	A	1: Broadcast foliar; end of flowering: 1st pods visible (approx. 5mm length)	19.99	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; first pods reached final length (15-20 mm)	20.10	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	20.03	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~10% pods ripe, beans final color, dry & hard	20.05	0.20			
ND; 2002	20% WG	A	1: Broadcast foliar; ~70% pods reached final length (15-20 mm)	29.63	0.20	7	0.39	Non-silicone spray adjuvant
			2: Broadcast foliar; ~all pods reached final length (15-20 mm)	29.67	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	30.01	0.20	7	0.41	Non-silicone spray adjuvant
			2: Broadcast foliar; first pod ripe, beans final color, dry and hard	30.85	0.21			
ND; 2002	20% WG	A	1&2: Broadcast foliar; ~all pods reached final length (15-20 mm)	29.41	0.20	7	0.40	Non-silicone spray adjuvant
				30.13	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	30.33	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; first pod ripe, beans final color, dry and hard	29.76	0.20			
ND; 2002	20% WG	A	1: Broadcast foliar; ~70% pods reached final length (15-20 mm)	25.08	0.20	7	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~all pods reached final length (15-20 mm)	25.06	0.20			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	24.90	0.20	8	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~20% pods ripe, beans final color, dry & hard	25.15	0.20			
SD; 2002	20% WG	A	1&2: Broadcast foliar; ~70% pods reached final length (15-20 mm)	25.01	0.1994	7	0.40	Non-silicone spray adjuvant
				24.86	0.1989			
		B	1: Broadcast foliar; ~all pods reached final length (15-20 mm)	25.11	0.2009	8	0.40	Non-silicone spray adjuvant
			2: Broadcast foliar; ~30% pods ripe, beans final color, dry & hard	25.06	0.2001			

TABLE B.1.2. Study Use Pattern.

Location (State/Province; Year)	EP[1]	Application						Tank Mix Adjuvants
		Treatment type [2]		Method; Timing	Vol. (GPA[3])	Rate (lb ai/A)	RTI[4] (days)	Total Rate (lb ai/A)	
IL; 2002	20% WG	A	1: B reac	adcast foliar; ~70% pods d final length (15-20 mm)	22.96	0.20	7	0.39	Non-silicone spray adjuvant
			2: B reac	adcast foliar; ~all pods d final length (15-20 mm)	28.22	0.19			
		B	1&2 reac	Broadcast foliar; ~all pods d final length (15-20 mm)	28.72	0.20	7	0.40	Non-silicone spray adjuvant
					32.47	0.20			
IL; 2002	20% WG	A	1: B reac	adcast foliar; ~30% pods d final length (15-20 mm)	26.07	0.20	6	0.40	Non-silicone spray adjuvant
			2: B reac	adcast foliar; ~50% pods d final length (15-20 mm)	34.79	0.20			
		B	1: B reac	adcast foliar; ~40% pods d final length (15-20 mm)	21.33	0.20	7	0.40	Non-silicone spray adjuvant
			2: B reac	adcast foliar; ~70% pods d final length (15-20 mm)	33.73	0.20			
QC; 2002	20% WG	A	1: B reac	adcast foliar; ~70% pods d final length (15-20 mm)	28.05	0.19	7	0.39	Non-silicone spray adjuvant
			2: B reac	adcast foliar; ~all pods d final length (15-20 mm)	27.69	0.20			
		B	1: B reac	oadcast foliar; ~all pods d final length (15-20 mm)	28.05	0.19	7	0.38	Non-silicone spray adjuvant
			2: B bea	oadcast foliar; first pod ripe, final color, dry and hard	29.60	0.20			

[1] EP = End-use Product
[2] Treatment Type A = First application w s made 12 days prior to harvest of immature seed; second application was made 7 (± 1) days after the first application. Treatmer Type B = First application was made 28 days prior to mature seed harvest; second application was made 7 (± 1) days after t e first application.
[3] GPA = Gallons per acre
[4] RTI = Retreatment Interval

TABLE B.1.3. Trial Numbers a d Geographical Locations.

NAFTA Growing Region	Soybean		
	Submitted	Requested	
		Canada	US
2	2		2
4	2		3
5	12		15
5B	1		
Total	17		20

B.2. Sample Handling an Preparation

Samples of green immature soybean seed and soybean forage were collected ~5 and ~14 days, respectively, following treatment type A. Samples of mature soybean seed and soybean hay were collected ~21 days following treatment type B. Specific harvesting procedures were not described. Samples were bagged and stored frozen (temperature not specified) on the day of harvest. Samples of immature soybean seed and soybean forage were shipped frozen within 7-56 days of harvest and samples of mature soybean seed and soybean hay were shipped frozen within 1-33 days of harvest to BASF Agro Research (Research Triangle Park, NC) for analysis.

Additional samples of soybean seed from the control and treatment type B plot were collected from a single NE field trial and shipped frozen 19 days after harvest to the Food Protein Center of Texas A&M University for generation of commercially representative aspirated grain fraction (AGF) samples; AGF samples were generated within 29 days of receipt. A description of the procedure used to generate the aspirated grain fraction and material balance sheets were included. Briefly, seed samples were dried, if necessary, to a moisture content of 10-13% and placed in a dust generation room for 2 hours to remove light particles (grain dust); these particles were classified by size and recombined for ash determination and residue analysis. Samples of aspirated grain fractions were frozen and shipped overnight to BASF Agro Research (Research Triangle Park, NC) for analysis.

B.3. Analytical Methodology

Samples of soybean forage, seed (immature green and mature), hay, and aspirated grain fractions were analyzed for residues of pyraclostrobin and its metabolite BF 500-3 using LC/MS/MS, BASF Method Number D9908. A brief description of the method was included in the submission. BASF Method Number D9908 is similar to the proposed enforcement method (LC/MS/MS BASF Method Number D9808) submitted in conjunction with a previous pyraclostrobin petition (PP#0F06139; DP Barcodes D269668, etc., L. Cheng, 11/28/01). Method D9908 used an alternate extraction option: soybean commodities were extracted with methanol:water:2 N HCl (7:2.5:0.5; v:v:v) instead of methanol:water (7:3; v:v). Residues are analyzed by LC/MS/MS. For quantitation, the product/daughter ion for the transition *m/z* 388 → 194 for pyraclostrobin (BAS 500 F) and *m/z* 358 → 164 for BAS 500-3 are measured. The limit of quantitation (LOQ) was 0.02 ppm for each analyte (pyraclostrobin and BF 500-3) in/on all soybean matrices. The limit of detection (LOD), defined as the lowest standard level injected with an analysis set, was 0.1 ng/mL for each analyte.

C. RESULTS AND DISCUSSION

Sample storage conditions and intervals are summarized in Table C.2. The maximum storage intervals of crop samples from harvest to analysis were 170 days (5.6 months) for immature soybean seed, 174 days (5.7 months) for soybean forage, 130 days (4.3 months) for mature soybean seed, 142 days (4.7 months) for soybean hay, and 99 days (3.3 months) for aspirated grain fractions. No storage stability data have been submitted with this petition. Available storage stability data indicated that residues of pyraclostrobin and its metabolite BF 500-3 are relatively stable under frozen storage conditions in/on fortified samples of grape juice, sugar beet

tops and roots, tomatoes, and w eat grain and straw for up to 25 months, and in/on fortified samples of peanut nutmeat and rocessed oil for up to 19 months. The storage stability data can be translated to support the stor ge intervals for soybean, forage and hay for this study (D269668, etc., L. Cheng, 11/28/2001).

Concurrent method recovery da a are presented in Table C.1. Samples of soybean forage, seed (immature green and mature), h y, and aspirated grain fractions were analyzed for residues of pyraclostrobin and its metaboli BF 500-3 using LC/MS/MS, BASF Method Number D9908. The method LOQ was 0.02 ppr for each analyte. This method is adequate for data collection based on acceptable concurrent nethod recovery data. Apparent residues of pyraclostrobin and its metabolite BF 500-3 were e ch below the method LOQ (<0.02 ppm) in/on all untreated soybean forage, seed (immatur green and mature), hay, and aspirated grain fraction samples.

Residue data from the soybean ield trials are reported in Table C.3. A summary of residue data for soybean forage, seed (imm ure green and mature), hay, and aspirated grain fractions following treatment with the 2(% WG formulation is presented in Table C.4. The combined residues of pyraclostrobin and s metabolite BF 500-3 were <0.04-0.362 ppm in/on treated samples of green immature soy ean seed and 0.740-3.87 ppm in/on treated samples of soybean forage harvested at the 5/6- an 13/14-day PHI, respectively, following treatment type A (two broadcast foliar applications of he 20% WG formulation for a total rate of 0.39-0.41 lb ai/A, with the first application made 2 days prior to harvest). The combined residues of pyraclostrobin and its metaboli BF 500-3 were <0.04 ppm in/on treated samples of mature soybean seed and 0.05-6.13 pp in/on treated samples of soybean hay harvested at the 20- to 22-day PHI following treatmer type B (two broadcast foliar applications of the 20% WG formulation for a total rate of (38-0.41 lb ai/A, with the first application made 28 days prior to harvest).

Residues of pyraclostrobin anc its metabolite BF 500-3 concentrated 3.4x in aspirated grain fractions collected from treate soybean seed, which bore residues below the method LOQ (<0.02 ppm) for each analyte. The combined residues of pyraclostrobin and its metabolite BF 500-3 were <0.08 and 0.19 ppm (average 0.135 ppm) in aspirated grain fractions from soybean seed harvested at the 1-day PHI following treatment B from a single trial.

A total of 17 soybean field tria s were conducted encompassing Regions 2 (GA and VA; 2 trials), 4 (AR; 2 trials), 5 (IA, IL, MN ND, NE, SD, and WI; 12 trials), and 5B (QC; 1 trial), during the 2002 growing season. The loc tions of field trials are in accordance with OPPTS Guideline 860.1500; however, three addi ional field trials, encompassing Regions 4 (1 trial) and 5 (2 trials), are required for adequate geog aphic representation.

TABLE C.1. Summary of Concurrent Recoveries of Pyraclostrobin and its Metabolite BF 500-3 from Soybean Commodities.

Matrix	Spike level (ppm)	Sample size (n)	Recoveries (%)	Mean ± std dev
Pyraclostrobin				
immature soybean seed, green	0.02	3	82.5, 85.0, 88.0	88.6 ± 5.1
	1.0	3	89.4, 89.4, 97.4	
soybean forage	0.02	4	79.5, 93.5, 94.5, 117.0	95.3 ± 11.2
	1.0	3	87.5, 90.4, 96.6	
	50.0	1	103.6	
mature soybean seed	0.02	3	99.5, 100.0, 110.5	96.6 ± 10.9
	1.0	3	81.2, 86.0, 102.6	
soybean hay	0.02	3	70.0, 82.5, 104	92.7 ± 13.5
	1.0	2	98.4, 102.0	
	50.0	1	99.4	
BF 500-3				
immature soybean seed, green	0.02	3	78.0, 78.5, 79.0	83.5 ± 6.7
	1.0	3	84.0, 86.0, 95.4	
soybean forage	0.02	4	70.5, 97.5, 98.0, 101	90.9 ± 11.1
	1.0	3	78.8, 86.7, 98.4	
	50.0	1	96.6	
mature soybean seed	0.02	3	79.5, 87.0, 105.0	93.1 ± 10.5
	1.0	3	90.0, 90.8, 106.2	
soybean hay	0.02	3	76.0, 82.0, 92.0	90.2 ± 9.2
	1.0	2	95.4, 98.2	
	50.0	1	97.8	

TABLE C.2. Summary of Storage Conditions.

Matrix (RAC or Extract)	Storage Temp. (°C)	Actual Storage Duration [1]	Interval of Demonstrated Storage Stability [2]
Immature soybean seed, green	<-10	107-170 days (3.5-5.6 months)	The available storage stability data indicate that residues of pyraclostrobin and its metabolite BF 500-3 are relatively stable under frozen storage conditions in/on fortified samples of grape juice, sugar beet tops and roots, tomatoes, and wheat grain and straw for up to 25 months, and in/on fortified samples of peanut nutmeat and processed oil for up to 19 months.
Soybean forage	<-10	55-174 days (1.8-5.7 months)	
Mature soybean seed	<-10	79-130 days (2.6-4.3 months)	
Soybean hay	<-10	88-142 days (2.9-4.7 months)	
Aspirated grain fractions	<-10	91-99 days [3] (3.0-3.3 months)	

[1] All soybean samples were analyzed within 0-5 days of extraction.
[2] Refer to storage stability data reviewed in conjunction with a previous pyraclostrobin petition (PP#0F06139; DP Barcode D269668, etc., L. Cheng, 11/28/01).
[3] Based on the date listed on the chromatograms; actual extraction and analysis dates were not provided for AGF samples.

TABLE C.3. Residue Data from : oybean Field Trials with Pyraclostrobin.

Trial ID (State/Province; Year)	Region	Crop; Variety	Tr 1	tment pe [1]	Commodity or Matrix	Total Rate (lb ai/A)	PHI (days)	Residues (ppm)		
								Pyraclostrobin	BF 500-3	Total
GA; 2002	2	Soybean; NK RR S73-Z5		A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.40	14	2.48, 2.91	0.30, 0.34	2.78, 3.25
				B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	21	0.76, 0.99	0.11, 0.12	0.87, 1.11
VA; 2002	2	Soybean; NK S53Q7 7B-1001		A	immature seed, green	0.41	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.41	14	2.04, 2.70	0.24, 0.36	2.24, 3.06
				B	mature seed	0.41	22	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.41	22	0.72, 0.92	0.19, 0.25	0.91, 1.17
AR; 2002	4	Soybean; AG4403		A	immature seed, green	0.40	5	0.278, 0.324 [2]	0.033, 0.038 [2]	0.311, 0.362 [2]
				A	forage	0.40	14	3.19, 3.24	0.62, 0.63	3.81, 3.87
				B	mature seed	0.40	20	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	20	1.37, 1.38	0.76, 0.77	2.13, 2.15
AR; 2002	4	Soybean; AG5603		A	immature seed, green	0.40	5	<0.02, 0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.40	14	1.09, 1.39	0.31, 0.40	1.39, 1.79
				B	mature seed	0.40	22	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	22	0.64, 0.66	0.37, 0.38	1.01, 1.04
WI; 2002	5	Soybean; BR2099 RR		A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.40	14	0.75, 0.88	0.09, 0.08	0.84, 0.96
				B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	21	0.03, 1.47	<0.02, 0.29	<0.05, 1.76
MN; 2002	5	Soybean; BR2099 RR		A	immature seed, green	0.40	6	0.05, 0.08	<0.02, <0.02	<0.07, <0.10
				A	forage	0.40	14	2.42, 3.06	0.29, 0.31	2.71, 3.37
				B	mature seed	0.40	22	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	22	0.96, 1.01	0.27, 0.27	1.23, 1.28
IA; 2002	5	Soybean; SG 2531RR		A	immature seed, green	0.41	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.41	14	1.08, 1.59	0.30, 0.30	1.38, 1.89
				B	mature seed	0.41	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.41	21 [3]	1.47, 1.47	0.63, 0.68	2.10, 2.15

TABLE C.3. Residue Data from Soybean Field Trials with Pyraclostrobin.

Trial ID (State/Province; Year)	Region	Crop; Variety	Treatment Type [1]	Commodity or Matrix	Total Rate (lb ai/A)	PHI (days)	Residues (ppm)		
							Pyraclostrobin	BF 500-3	Total
IA; 2002	5	Soybean; SG 2533RR	A	immature seed, green	0.41	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.41	14	0.65, 0.84	0.13, 0.18	0.78, 1.02
			B	mature seed	0.41	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.41	21	0.65, 0.79	0.21, 0.25	0.86, 1.04
NE; 2002	5	Soybean; Asgrow A2553	A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.40	14	1.09, 1.11	0.45, 0.53	1.54, 1.64
			B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.40	21	4.10, 4.25	1.85, 1.88	5.95, 6.13
NE; 2002	5	Soybean; Asgrow 2703	A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.40	13	1.33, 2.16	0.23, 0.39	1.56, 2.55
			B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	AGF	0.40	21	0.06, 0.16	<0.02, 0.03	<0.08, 0.19
			B	hay	0.40	21	1.70, 2.64	0.64, 1.14	2.34, 3.78
ND; 2002	5	Soybean; Mycogen 5007	A	immature seed, green	0.39	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.39	14	1.58, 1.62	0.16, 0.17	1.74, 1.79
			B	mature seed	0.41	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.41	21	2.00, 2.18	0.36, 0.60	2.36, 2.78
ND; 2002	5	Soybean; Mycogen 5007	A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.40	14	2.40, 3.22	0.29, 0.28	2.69, 3.50
			B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.40	21	2.30, 2.82	0.54, 0.65	2.84, 3.47
ND; 2002	5	Soybean; Crop0land RT0583	A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.40	14	0.67, 1.34	0.07, 0.13	0.74, 1.47
			B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.40	21	1.79, 1.80	0.60, 0.59	2.39, 2.39
SD; 2002	5	Soybean; Cropland RT 0583	A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			A	forage	0.40	14	1.41, 1.96	0.18, 0.25	1.59, 2.21
			B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
			B	hay	0.40	21	1.81, 1.92	0.69, 0.71	2.50, 2.63

TABLE C.3. Residue Data from) ybean Field Trials with Pyraclostrobin.

Trial ID (State/Province; Year)	*Region*	*Crop;* Variety	Tre T	tment pe [1]	Commodity or Matrix	Total Rate (lb ai/A)	PHI (days)	Residues (ppm)		
								Pyraclostrobin	BF 500-3	Total
IL; 2002	5	Soybean; B-T 441 CR		A	immature seed, green	0.39	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.39	14	1.24, 1.37[2]	0.16, 0.20[2]	1.40, 1.57[2]
				B	mature seed	0.40	20	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	20	1.83, 2.00	0.45, 0.39	2.28, 2.39
IL; 2002	5	Soybean; Asgrow AG3302		A	immature seed, green	0.40	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.40	14	0.90, 0.89	0.18, 0.20	1.08, 1.09
				B	mature seed	0.40	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.40	21	2.14, 2.16	0.49, 0.51	2.63, 2.67
QC; 2002	5B	Soybean; DKB07-51		A	immature seed, green	0.39	5	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				A	forage	0.39	14	1.70, 2.00	0.21, 0.22	1.91, 2.22
				B	mature seed	0.38	21	<0.02, <0.02	<0.02, <0.02	<0.04, <0.04
				B	hay	0.38	21	1.74, 1.96	0.45, 0.46	2.19, 2.42

[1] Treatment Type A = First application v s made 12 days prior to harvest of immature seed; second application was made 7 (± 1) days after the first application. Treatm nt Type B = First application was made 28 days prior to mature seed harvest; second application was made 7 (± 1) days after t : first application.

[2] Replicate analyses of a single sample; tl : maximum residue is reported.

[3] Hay sample dried indoors for 5 days du to rain.

TABLE C.4. Summary of Residue Data from Soybean Crop Field Trials with Pyraclostrobin.

Commodity	Total Applic. Rate (lb ai/A)	PHI (days)	Analyte	Residue Levels (ppm)						
				n	Min.	Max.	HAFT[1]	Median (STMdR[2])	Mean (STMR[3])	Std. Dev.
Immature soybean seed, green [4]	0.39-0.41	5-6	pyraclostrobin	34	<0.02	0.324	0.301	0.02	0.039	0.068
			BF 500-3	34	<0.02	0.038	0.036	0.02	0.021	0.004
			Total	34	<0.04	0.362	0.337	0.04	0.060	0.071
Soybean forage [4]	0.39-0.41	13-14	pyraclostrobin	34	0.65	3.24	3.22	1.50	1.72	0.81
			BF 500-3	34	0.07	0.63	0.63	0.25	0.27	0.14
			Total	34	0.74	3.87	3.84	1.77	1.98	0.89
Mature soybean seed [5]	0.38-0.41	20-22	pyraclostrobin	34	<0.02	<0.02	<0.02	<0.02	<0.02	0.0
			BF 500-3	34	<0.02	<0.02	<0.02	<0.02	<0.02	0.0
			Total	34	<0.04	<0.04	<0.04	<0.04	<0.04	0.0
Aspirated grain fractions [5]	0.40	21	pyraclostrobin	2	0.06	0.16	0.11	--	0.11	--
			BF 500-3	2	<0.02	0.03	<0.03	--	<0.03	--
			Total	2	<0.08	0.19	0.14	--	0.14	--
Soybean hay [5]	0.38-0.41	20-22	pyraclostrobin	34	0.03	4.25	4.18	1.72	1.66	0.90
			BF 500-3	34	<0.02	1.88	1.87	0.48	0.55	0.41
			Total	34	0.05	6.13	6.04	2.24	2.21	1.27

[1] HAFT = Highest Average Field Trial.
[2] STMdR = Supervised Trial Median Residue.
[3] STMR = Supervised Trial Mean Residue.
[4] Immature soybean seed (green) and soybean forage were harvested 5 and 14 days, respectively, following Treatment Type A (first application was made 12 days prior to harvest of immature seed; second application was made 7 (± 1) days after the first application).
[5] Mature soybean seed and soybean hay were harvested 21 days following Treatment Type B (first application was made 28 days prior to mature seed harvest; second application was made 7 (± 1) days after the first application).

D. CONCLUSION

The maximum combined residues of pyraclostrobin and its metabolite BF 500-3 were 0.362 ppm in/on treated samples of green immature soybean seed and 3.87 ppm in/on treated samples of soybean forage harvested at the 5/6- and 13/14-day PHI, respectively, following treatment type A (the first application was made 12 days prior to harvest of immature seed and the second application was made 7 (± 1) days after the first application). The maximum combined residues of pyraclostrobin and its metabolite BF 500-3 were <0.04 ppm in/on treated samples of mature soybean seed and 6.13 ppm in/on treated samples of soybean hay harvested at the 20- to 22-day PHI following treatment type B(the first application was made 28 days prior to mature seed harvest and the second application was made 7 (± 1) days after the first application).

E. REFERENCES

DP Barcodes: D269668, D272 71, D272789, D274095, D274192, D274471, D274957, D275843, and D 278429

Subject: PP#0F06139. F Code 099100. Pyraclostrobin on Various Crops: Bananas (import), Barley Berries, Bulb Vegetables, Citrus Fruits, Cucurbit Vegetables, Dried Shelled P a & Bean (except Soybean), Fruiting Vegetables, Grapes, Grass, Peanut, Pistachi , Root Vegetables (except Sugar Beet), Rye, Snap Beans, Stone Fruits, Strawbe y, Sugar Beet, Tree Nuts, Tuberous and Corm Vegetables, and Wheat. Review of Analytical Methods and Residue Data. EPA File Symbols: 7969-RIT, 796 RIA. CAS #175013-18-0.

From: L. Cheng

To: C. Giles-Parker . Bazuin

Dated: 11/28/01

MRIDs: 45118428-4511 4-37, 45118501-45118512, 45118514-45118537, 45118601-4511 625, 45160501, 45272801, 45274901, 45321101, 45367501, 45399401, and 5429901

F. DOCUMENT TRAC ING

RDI:ChemTeam:06/29/04:L.C eng: 07/22/04
Petition Number(s): PP#2F06 31
DP Barcode(s): D290342, D2 0343, and D290369
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